

## CHAPTER II

Preliminary Classification:

Proposed Class:

Subclass:

NOTE: "All applicants are requested to include a preliminary classification on newly filed patent applications. The preliminary classification, preferably class and subclass designations, should be identified in the upper right-hand corner of the letter of transmittal accompanying the application papers, for example "Proposed Class 2, subclass 129." M.P.E.P., § 601, 7th ed.

**TRANSMITTAL LETTER  
TO THE UNITED STATES ELECTED OFFICE (EO/US)  
(ENTRY INTO U.S. NATIONAL PHASE UNDER CHAPTER II)**

INTERNATIONAL APPLICATION NO. PCT/US00/03585	INTERNATIONAL FILING DATE 11 February 2000	PRIORITY DATE CLAIMED 4 March 1999
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TITLE OF INVENTION

TECHNIQUE FOR EFFECTIVE MANAGEMENT OF RESOURCE CONSUMPTION

APPLICANT(S)

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Box PCT

Assistant Commissioner for Patents

Washington D.C. 20231

ATTENTION: EO/US

**CERTIFICATION UNDER 37 C.F.R. §§ 1.8(a) and 1.10\***

(When using Express Mail, the Express Mail label number is mandatory;  
Express Mail certification is optional.)

I hereby certify that, on the date shown below, this correspondence is being:

**MAILING**

- ☒ deposited with the United States Postal Service in an envelope addressed to the Assistant Commissioner for Patents, Washington, D.C. 20231

37 C.F.R. § 1.8(a)

37 C.F.R. § 1.10 \*

- ☐ with sufficient postage as first class mail.

☒ as "Express Mail Post Office to Addressee"

Mailing Label No. EL627509155US (mandatory)

**TRANSMISSION**

- ☐ facsimile transmitted to the Patent and Trademark Office, (703) \_\_\_\_\_

Signature

Elaine Mian

(type or print name of person certifying)

Date: 4 September 2001

\* Only the date of filing (§ 1.6) will be the date used in a patent term adjustment calculation, although the date on any certificate of mailing or transmission under § 1.8 continues to be taken into account in determining timeliness. See § 1.703(f). Consider "Express Mail Post Office to Addressee" (§ 1.10) or facsimile transmission (§ 1.6(d)) for the reply to be accorded the earliest possible filing date for patent term adjustment calculations.

**NOTE:** To avoid abandonment of the application, the applicant shall furnish to the USPTO, not later than 20 months from the priority date: (1) a copy of the international application, unless it has been previously communicated by the International Bureau or unless it was originally filed in the USPTO; and (2) the basic national fee (see 37 C.F.R. § 1.492(e)). The 30-month time limit may not be extended. 37 C.F.R. § 1.495.

**WARNING:** Where the items are those which can be submitted to complete the entry of the international application into the national phase are subsequent to 30 months from the priority date the application is still considered to be in the international state and if mailing procedures are utilized to obtain a date the express mail procedure of 37 C.F.R. § 1.10 must be used (since international application papers are not covered by an ordinary certificate of mailing—See 37 C.F.R. § 1.8.

**NOTE:** Documents and fees must be clearly identified as a submission to enter the national state under 35 U.S.C. § 371 otherwise the submission will be considered as being made under 35 U.S.C. § 111. 37 C.F.R. § 1.494(f).

- I. Applicant herewith submits to the United States Elected Office (EO/US) the following items under 35 U.S.C. § 371:
  - a. ☒ This express request to immediately begin national examination procedures (35 U.S.C. § 371(f)).
  - b. ☒ The U.S. National Fee (35 U.S.C. § 371(c)(1)) and other fees (37 C.F.R. § 1.492) as indicated below:

## 2. Fees

CLAIMS FEE	(1) FOR	(2) NUMBER FILED	(3) NUMBER EXTRA	(4) RATE	(5) CALCULATIONS
<input type="checkbox"/> *	TOTAL CLAIMS				
	55	- 20 =	35	× \$18.00 =	\$ 630.00
	INDEPENDENT CLAIMS				
	6	6 - 3 =	3	× \$80.00 =	240.00
	MULTIPLE DEPENDENT CLAIM(S) (if applicable)				+ \$270.00
BASIC FEE**	<input checked="" type="checkbox"/> U.S. PTO WAS INTERNATIONAL PRELIMINARY EXAMINATION AUTHORITY Where an International preliminary examination fee as set forth in § 1.482 has been paid on the international application to the U.S. PTO: XX and the international preliminary examination report states that the criteria of novelty, inventive step (non-obviousness) and industrial activity, as defined in PCT Article 33(1) to (4) have been satisfied for all the claims presented in the application entering the national stage (37 C.F.R. § 1.492(a)(4)) ..... \$100.00 <input type="checkbox"/> and the above requirements are not met (37 C.F.R. § 1.492(a)(1)) ..... \$690.00 <input type="checkbox"/> U.S. PTO WAS NOT INTERNATIONAL PRELIMINARY EXAMINATION AUTHORITY Where no international preliminary examination fee as set forth in § 1.482 has been paid to the U.S. PTO, and payment of an international search fee as set forth in § 1.445(a)(2) to the U.S. PTO: <input type="checkbox"/> has been paid (37 C.F.R. § 1.492(a)(2)) ..... \$710.00 <input type="checkbox"/> has not been paid (37 C.F.R. § 1.492(a)(3)) ..... \$1000.00 <input type="checkbox"/> where a search report on the international application has been prepared by the European Patent Office or the Japanese Patent Office (37 C.F.R. § 1.492(a)(5)) ..... \$860.00				100.00
	Total of above Calculations				= 970.00
SMALL ENTITY	Reduction by 1/2 for filing by small entity, if applicable. Assertion must be made. (note 37 C.F.R. § 1.27)				-
	Subtotal				970.00
	Total National Fee				\$ 970.00
	Fee for recording the enclosed assignment document \$40.00 (37 C.F.R. § 1.21(h)). (See Item 13 below). See attached "ASSIGNMENT COVER SHEET".				
TOTAL	Total Fees enclosed				\$ 970.00

\*See attached Preliminary Amendment Reducing the Number of Claims.

- ☒ Attached is a ☒ check ☐ money order in the amount of \$ 970.00
- ☐ Authorization is hereby made to charge the amount of \$ \_\_\_\_\_
- ☒ to Deposit Account No. 16-1350
- ☐ to Credit card as shown on the attached credit card information authorization form PTO-2038.

**WARNING:** Credit card information should not be included on this form as it may become public.

- ☒ Charge any additional fees required by this paper or credit any overpayment in the manner authorized above.

A duplicate of this paper is attached.

**\*\*WARNING:** "To avoid abandonment of the application the applicant shall furnish to the United States Patent and Trademark Office not later than the expiration of 30 months from the priority date: \* \* \* (2) the basic national fee (see § 1.492(a)). The 30-month time limit may not be extended." 37 C.F.R. § 1.495(b).

**WARNING:** If the translation of the international application and/or the oath or declaration have not been submitted by the applicant within thirty (30) months from the priority date, such requirements may be met within a time period set by the Office. 37 C.F.R. § 1.495(b)(2). The payment of the surcharge set forth in § 1.492(e) is required as a condition for accepting the oath or declaration later than thirty (30) months after the priority date. The payment of the processing fee set forth in § 1.492(f) is required for acceptance of an English translation later than thirty (30) months after the priority date. Failure to comply with these requirements will result in abandonment of the application. The provisions of § 1.136 apply to the period which is set. Notice of Jan. 3, 1993, 1147 O.G. 29 to 40.

☐ **Assertion of Small Entity Status**

☐ **Applicant hereby asserts status as a small entity under 37 C.F.R. § 1.27.**

**NOTE:** 37 C.F.R. § 1.27(c) deals with the assertion of small entity status, whether by a written specific declaration thereof or by payment as a small entity of the basic filing fee or the fee for the entry into the national phase as states:

"(c) Assertion of small entity status. Any party (person, small business concern or nonprofit organization) should make a determination, pursuant to paragraph (f) of this section, of entitlement to be accorded small entity status based on the definitions set forth in paragraph (a) of this section, and must, in order to establish small entity status for the purpose of paying small entity fees, actually make an assertion of entitlement to small entity status, in the manner set forth in paragraphs (c)(1) or (c)(3) of this section, in the application or patent in which such small entity fees are to be paid.

(1) Assertion by writing. Small entity status may be established by a written assertion of entitlement to small entity status. A written assertion must:

(i) Be clearly identifiable;

(ii) Be signed (see paragraph (c)(2) of this section); and

(iii) Convey the concept of entitlement to small entity status, such as by stating that applicant is a small entity, or that small entity status is entitled to be asserted for the application or patent. While no specific words or wording are required to assert small entity status, the intent to assert small entity status must be clearly indicated in order to comply with the assertion requirement.

(2) Parties who can sign and file the written assertion. The written assertion can be signed by:

(i) One of the parties identified in §§ 1.33(b) (e.g., an attorney or agent registered with the Office, §§ 3.73(b) of this chapter notwithstanding, who can also file the written assertion;

(ii) At least one of the individuals identified as an inventor (even though a §§ 1.63 executed oath or declaration has not been submitted), notwithstanding §§ 1.33(b)(4), who can also file the written assertion pursuant to the exception under §§ 1.33(b) of this part; or

(iii) An assignee of an undivided part interest, notwithstanding §§ 1.33(b)(3) and 3.73(b) of this chapter, but the partial assignee cannot file the assertion without resort to a party identified under §§ 1.33(b) of this part.

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(3) Assertion by payment of the small entity basic filing or basic national fee. The payment, by any party, of the exact amount of one of the small entity basic filing fees set forth in §§ 1.16(e), (f), (g), (h), or (i), or one of the small entity basic national fees set forth in §§ 1.492(a)(1), (a)(2), (a)(3), (a)(4), or (a)(5), will be treated as a written assertion of entitlement to small entity status even if the type of basic filing or basic national fee is inadvertently selected in error.

(i) If the Office accords small entity status based on payment of a small entity basic filing or basic national fee under paragraph (c)(3) of this section that is not applicable to that application, any balance of the small entity fee that is applicable to that application will be due along with the appropriate surcharge set forth in §§ 1.16(e), or §§ 1.16(i).

(ii) The payment of any small entity fee other than those set forth in paragraph (c)(3) of this section (whether in the exact fee amount or not) will not be treated as a written assertion of entitlement to small entity status and will not be sufficient to establish small entity status in an application or a patent."

3. ☒ A copy of the International application as filed (35 U.S.C. § 371(c)(2)):

NOTE: Section 1.495 (b) was amended to require that the basic national fee and a copy of the international application must be filed with the Office by 30 months from the priority date to avoid abandonment. "The International Bureau normally provides the copy of the international application to the Office in accordance with PCT Article 20. At the same time, the International Bureau notifies applicant of the communication to the Office. In accordance with PCT Rule 47.1, that notice shall be accepted by all designated offices as conclusive evidence that the communication has duly taken place. Thus, if the applicant desires to enter the national stage, the applicant normally need only check to be sure the notice from the International Bureau has been received and then pay the basic national fee by 30 months from the priority date." Notice of Jan. 7, 1993, 1147 O.G. 29 to 40, at 35-36. See item 14c below.

- a. ☐ is transmitted herewith.  
b. ☒ is not required, as the application was filed with the United States Receiving Office.

- c. ☐ has been transmitted

- i. ☐ by the International Bureau.

Date of mailing of the application (from form PCT/1B/308):

- ii. ☐ by applicant on \_\_\_\_\_. (Date)

4. ☒ A translation of the International application into the English language (35 U.S.C. § 371(c)(2)):

- a. ☐ is transmitted herewith.  
b. ☒ is not required as the application was filed in English.  
c. ☐ was previously transmitted by applicant on \_\_\_\_\_. (Date)  
d. ☐ will follow.

5. ☒ Amendments to the claims of the international application under PCT Article 19 (35 U.S.C. § 371(c)(3)):

NOTE: The Notice of January 7, 1993 points out that 37 C.F.R. § 1.495(a) was amended to clarify the existing and continuing practice that PCT Article 19 amendments must be submitted by 30 months from the priority date and this deadline may not be extended. The Notice further advises that: "The failure to do so will not result in loss of the subject matter of the PCT Article 19 amendments. Applicant may submit that subject matter in a preliminary amendment filed under section 1.121. In many cases, filing an amendment under section 1.121 is preferable since grammatical or idiomatic errors may be corrected." 1147 O.G. 29-40, at 36.

- a. ☐ are transmitted herewith.
  - b. ☐ have been transmitted
    - i. ☐ by the International Bureau.  
Date of mailing of the amendment (from form PCT/1B/308):  
z \_\_\_\_\_
    - ii. ☐ by applicant on \_\_\_\_\_ (Date)
  - c. ☒ have not been transmitted as
    - i. ☒ applicant chose not to make amendments under PCT Article 19.  
Date of mailing of Search Report (from form PCT/ISA/210.):  
6/7/2000
    - ii. ☐ the time limit for the submission of amendments has not yet expired. The amendments or a statement that amendments have not been made will be transmitted before the expiration of the time limit under PCT Rule 46.1.
6. ☐ A translation of the amendments to the claims under PCT Article 19 (38 U.S.C. § 371(c)(3)):
- a. ☐ is transmitted herewith.
  - b. ☐ is not required as the amendments were made in the English language.
  - c. ☐ has not been transmitted for reasons indicated at point 5(c) above.
7. ☒ A copy of the international examination report (PCT/IPEA/409)
- ☐ is transmitted herewith.
  - ☒ is not required as the application was filed with the United States Receiving Office.
8. ☐ Annex(es) to the international preliminary examination report
- a. ☐ is/are transmitted herewith.
  - b. ☐ is/are not required as the application was filed with the United States Receiving Office.
9. ☐ A translation of the annexes to the international preliminary examination report
- a. ☐ is transmitted herewith.
  - b. ☐ is not required as the annexes are in the English language.

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10. ☒ An oath or declaration of the inventor (35 U.S.C. § 371(c)(4)) complying with 35 U.S.C. § 115
- a. ☐ was previously submitted by applicant on \_\_\_\_\_. (Date)
  - b. ☐ is submitted herewith, and such oath or declaration
    - i. ☐ is attached to the application.
    - ii. ☐ identifies the application and any amendments under PCT Article 19 that were transmitted as stated in points 3(b) or 3(c) and 5(b); and states that they were reviewed by the inventor as required by 37 C.F.R. § 1.70.
  - c. ☒ will follow.

II. Other document(s) or information included:

11. ☒ An International Search Report (PCT/ISA/210) or Declaration under PCT Article 17(2)(a):
- a. ☒ is transmitted herewith.
  - b. ☐ has been transmitted by the International Bureau.  
Date of mailing (from form PCT/IB/308): \_\_\_\_\_
  - c. ☐ is not required, as the application was searched by the United States International Searching Authority.
  - d. ☐ will be transmitted promptly upon request.
  - e. ☐ has been submitted by applicant on \_\_\_\_\_. (Date)
12. ☒ An Information Disclosure Statement under 37 C.F.R. §§ 1.97 and 1.98:
- a. ☒ is transmitted herewith.

Also transmitted herewith is/are:

- ☒ Form PTO-1449 (PTO/SB/08A and 08B).
  - ☐ Copies of citations listed.
  - b. ☐ will be transmitted within THREE MONTHS of the date of submission of requirements under 35 U.S.C. § 371(c).
  - c. ☐ was previously submitted by applicant on \_\_\_\_\_. (Date)
13. ☐ An assignment document is transmitted herewith for recording.

A separate ☐ "COVER SHEET FOR ASSIGNMENT (DOCUMENT) ACCOMPANYING NEW PATENT APPLICATION" or ☐ FORM PTO 1595 is also attached.

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

14. ☒ Additional documents:

- a. ☒ Copy of request (PCT/RO/101)
- b. ☒ International Publication No. WO 00/52614
  - i. ☒ Specification, claims and drawing
  - ii. ☐ Front page only
- c. ☒ Preliminary amendment (37 C.F.R. § 1.121)
- d. ☒ Other  
PCT/IB/304, PCT/IB/301, PCT/RO/106, PCT/RO/105, PCT/IPEA/401, PCT/IPEA/402  
PCT/IPEA/408, Response to Invitation to Correct Defects containing new drawings,  
PCT/IB/332, PCT Record. of Change, PCT/ISA/220, PCT/ISA/210, PCT/ISA/202

15. ☒ The above checked items are being transmitted

- a. ☒ before 30 months from any claimed priority date.
- b. ☐ after 30 months.

16. ☐ Certain requirements under 35 U.S.C. § 371 were previously submitted by the applicant on \_\_\_\_\_, namely:

\_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

**AUTHORIZATION TO CHARGE ADDITIONAL FEES**

**WARNING:** Accurately count claims, especially multiple dependant claims, to avoid unexpected high charges if extra claims are authorized.

**NOTE:** "A written request may be submitted in an application that is an authorization to treat any concurrent or future reply, requiring a petition for an extension of time under this paragraph for its timely submission, as incorporating a petition for extension of time for the appropriate length of time. An authorization to charge all required fees, fees under § 1.17, or all required extension of time fees will be treated as a constructive petition for an extension of time in any concurrent or future reply requiring a petition for an extension of time under this paragraph for its timely submission. Submission of the fee set forth in § 1.17(a) will also be treated as a constructive petition for an extension of time in any concurrent reply requiring a petition for an extension of time under this paragraph for its timely submission." 37 C.F.R. § 1.136(a)(3).

**NOTE:** "Amounts of twenty-five dollars or less will not be returned unless specifically requested within a reasonable time, nor will the payer be notified of such amounts; amounts over twenty-five dollars may be returned by check or, if requested, by credit to a deposit account." 37 C.F.R. § 1.26(a).

☒ Please charge, in the manner authorized above, the following additional fees that may be required by this paper and during the entire pendency of this application:

☒ 37 C.F.R. § 1.492(a)(1), (2), (3), and (4) (filing fees)

**WARNING:** Because failure to pay the national fee within 30 months without extension (37 C.F.R. § 1.495(b)(2)) results in abandonment of the application, it would be best to always check the above box.



- ☒ 37 C.F.R. § 1.492(b), (c) and (d) (presentation of extra claims)


*NOTE: Because additional fees for excess or multiple dependent claims not paid on filing or on later presentation must only be paid or these claims cancelled by amendment prior to the expiration of the time period set for response by the PTO in any notice of fee deficiency (37 C.F.R. § 1.492(d)), it might be best not to authorize the PTO to charge additional claim fees, except possible when dealing with amendments after final action.*

- ☒ 37 C.F.R. § 1.17 (application processing fees)
- ☒ 37 C.F.R. § 1.17(a)(1)-(5) (extension fees pursuant to § 1.136(a).
- ☐ 37 C.F.R. § 1.18 (issue fee at or before mailing of Notice of Allowance, pursuant to 37 C.F.R. § 1.311(b))

*NOTE: Where an authorization to charge the issue fee to a deposit account has been filed before the mailing of a Notice of Allowance, the issue fee will be automatically charged to the deposit account at the time of mailing the notice of allowance. 37 C.F.R. § 1.311(b).*

*NOTE: 37 C.F.R. § 1.28(b) requires "Notification of any change in loss of entitlement to small entity status must be filed in the application . . . prior to paying, or at the time of paying . . . issue fee." From the wording of 37 C.F.R. § 1.28(b): (a) notification of change of status must be made even if the fee is paid as "other than a small entity" and (b) no notification is required if the change is to another small entity.*

- ☒ 37 C.F.R. § 1.492(e) and (f) (surcharge fees for filing the declaration and/or filing an English translation of an International Application later than 30 months after the priority date).

  
 \_\_\_\_\_  
 SIGNATURE OF PRACTITIONER

Janik Marcovici

\_\_\_\_\_  
 (type or print name of practitioner)

PERMAN & GREEN, LLP

\_\_\_\_\_  
 P.O. Address

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Customer No.: 2512

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Express Mail No.: EL627509155US

In re Application of: BROOKNER et al.

INTERNATIONAL APPLICATION NO.: PCT/US00/03585

INTERNATIONAL FILING DATE: 2/11/00

TITLE: TECHNIQUE FOR EFFECTIVE MANAGEMENT OF RESOURCE  
CONSUMPTION

ATTORNEY DOCKET NO.: 770P009588-US(PCT)

Box PCT  
The Commissioner of Patents and Trademarks  
Washington, D.C. 20231

PRELIMINARY AMENDMENT

Dear Sir:


Please amend the above-identified, patent application as follows:

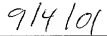
IN THE SPECIFICATION:

After the Title and before the first paragraph, please insert the following new paragraph:

This application claims the benefit of the earlier filed International Application No. PCT/US00/03585, International Filing Date, 11 February 2000, which designated the United States of America, and which international application was published under PCT Article 21(2) in English as WO Publication No. WO 00/52614.

Respectfully submitted,

  
\_\_\_\_\_  
Janik Marcovici Reg. No.: 42,841  
PERMAN & GREEN, LLP  
425 Post Road, Fairfield, CT 06430  
(203) 259-1800

  
\_\_\_\_\_  
Date

Customer No.: 2512

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5/ppts

DescriptionTECHNIQUE FOR EFFECTIVE  
MANAGEMENT OF RESOURCE CONSUMPTIONTechnical Field

The invention relates to resource management techniques, and more particularly to a technique for accounting for consumption of a resource, e.g.,  
5 utilization of a postal service.

Background of the Invention

Postage representing payment for a postal service makes up a significant portion of expenses of many businesses. For example, an insurance company  
10 routinely sends a large number of bills and correspondence to customers via mail, thereby incurring substantial postage.

To facilitate mailing of a large volume of mail, a franking system is often employed to frank, on  
15 mailpieces, postage indicia which serve as proof of postage. One such franking system may be a postage meter, or general purpose computer equipment, e.g., a personal computer (PC), having appropriate software installed therein for printing postage indicia using a  
20 local/network printer.

To secure accounting of postage dispensation, some postal authorities, e.g., the United States Postal Service (USPS), advocate use of a postal security device (PSD) in a franking system. For example, the USPS  
25 promulgated specifications for the design of the PSD under an Information-Based Indicia Program (IBIP).

In general, a PSD has a secure housing, and within the secure housing are accounting registers and a cryptographic engine. These accounting registers  
30 typically include an ascending register and a descending register. As is well known, the ascending register is used to keep track of the amount of postage dispensed.

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On the other hand, the descending register is used to keep track of the amount of postage available for postage dispensation. The cryptographic engine is used to sign certain postal information contained in a postage indicium to authenticate the same, in accordance with a well known public key algorithm. One such public key algorithm may be the Digital Signature Algorithm (DSA) described, e.g., in "Digital Signature Standard (DSS)," FIPS PUB 186, May 19, 1994. The cryptographic engine also carries out cryptographic authentication and signing for communications of the PSD with a remote data center, which may be maintained by a party other than a postal authority, e.g., a postage metering equipment or service provider. Such communications may be used to set up and maintain the PSD, and to replenish the postage fund by adjusting the value of the descending register in the PSD, in accordance with a well known telemeter setting (TMS) technique.

#### Summary of the Invention

We have recognized that the prior art use of the descending register to keep a postage fund in a PSD or franking system described above is inefficient. Specifically, in prior art, to avoid the inconvenience of performing the TMS frequently, e.g., daily, to adjust the descending register value to replenish the postage fund, a customer normally keeps the descending register value higher than the actual postage consumed each day. Depending on the volume of mail sent by the customer and the predictability of the mail volume, the descending register value can be significant, and the difference between the descending register value and the actual postage consumed each day may be substantial. We have recognized that such a difference represents undesirable illiquidity to the customer. For that matter, the prior art use of the descending register is totally undesirable as it causes the customer to commit a possibly large fund

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in the descending register which the customer has not spent for proof of payments, and does not even earn interest on.

- In accordance with the invention, the customer is charged only for the postage franked. As a result, no fund is tied up in a descending register in a franking system. In fact, the need of use of the descending register may be completely obviated. Thus, in accordance with the invention, records of franking transactions performed by the franking system are communicated to a remote data center from time to time, e.g., periodically, to account for the postage franked in a reporting period. Each record includes at least (a) transaction time information, (b) the franking transaction amount, and (c) an ascending register value indicating the cumulative postage franked. Based on the received records, the data center assesses the postage dispensed during the reporting period. The data center causes charging the assessed postage to an account associated with the franking system. In addition, the data center forwards a copy of the received records to another system for storage, which may be audited by the postal authority. The inventive arrangement may similarly be employed to account for other resource consumptions such as utility consumptions. In that case, the utility provider may also re-allocate the resource in a timely fashion in response to the customer needs based on statistics derived from the received records. For example, extraordinary consumption could relate to a malfunction which may otherwise have gone unnoticed for an extended period of time.

#### Brief Description of the Drawing

- Further objects, features and advantages of the invention will become apparent from the following detailed description taken in conjunction with the accompanying drawing, in which:

Fig. 1 is a block diagram of a franking system in accordance with the invention for conducting franking transactions to generate postage indicia;

Fig. 2 is a block diagram of a postal security device (PSD) used in the franking system of Fig. 1;

Fig. 3 illustrates a format of a franking transaction record stored in the PSD of Fig. 2;

Figs. 4A and 4B respectively illustrate franking transaction records in the format of Fig. 3;

Fig. 5 illustrates a postage finance arrangement in accordance with the invention;

Fig. 6 illustrates a format of a financial account record stored in a computer system in the arrangement of Fig. 5;

Fig. 7 illustrates a process performed by the computer system for effecting postage finance in accordance with the invention;

Fig. 8 illustrates a finance arrangement to account for consumption of a resource provided by a company in accordance with the invention;

Fig. 9 is a block diagram of a meter for reporting the resource consumption; and

Fig. 10 illustrates a finance arrangement to account for consumptions of different resources provided by more than one company in accordance with the invention.

#### Detailed Description

Fig. 1 illustrates franking system 100 embodying the principles of the invention for generating postage indicia. In this particular illustrative embodiment, system 100 is configured as an "open system," where computer 105 may be a conventional personal computer (PC) serving as a host device, and where postal security device (PSD) 110, printer 115 for franking or printing postage indicia, and modem 120 are peripherals to computer 105. Alternatively, computer 105 may be a

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workstation or any other general purpose computing machine. In addition, modem 120 in this instance is shown as an external modem, it will be appreciated that any internal modem or network interface card (NIC) within computer 105 may be used, instead.

Fig. 2 illustrates PSD 110 in accordance with the invention. PSD 110 may be secured by well known hardware protection means and other tamper-resistant methodologies. As shown in Fig. 2, PSD 110 comprises processor 203, clock 205, static random-access memory (SRAM) 207, a non-volatile memory, e.g., flash memory 209, communications interface 211 for interfacing with computer 105, and cryptographic engine 220.

In a prior art PSD, a descending register is used to keep track of the amount of postage available for postage dispensation. When the descending register value decreases over time below a predetermined limit, e.g., zero, a franking system can no longer dispense postage until the descending register is reset. Such a reset may be achieved by way of electronic funds transfer, in accordance with a well known telemeter setting (TMS) technique. However, to avoid the inconvenience of performing resets frequently, e.g., daily, a customer normally keeps the descending register value higher than the actual postage consumed each day. Depending on the volume of mail sent by the customer and the predictability of the mail volume, the descending register value can be significant, and the difference between the descending register value and the actual postage consumed each day may be substantial. We have recognized that such a difference represents undesirable illiquidity to the customer. For that matter, the prior art arrangement using a descending register to store an available postage fund is totally undesirable as it causes the customer to commit a possibly large fund in the descending register on which the customer does not even earn interest.

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In a postage finance arrangement in accordance with the invention described below, the customer is charged only for the postage franked. As a result, no fund is tied up in a descending register in a franking system. In fact, the need of use of the descending register may be completely obviated. The inventive postage finance arrangement involves communications of records of franking transactions by the franking system to a remote data center to account for the postage franked.

Thus, in this illustrative embodiment, PSD 110 contains no descending register. SRAM 207 however stores an ascending register value in ascending register 230. As is well known, ascending register 230 is used to keep track of the amount of postage dispensed. SRAM 207 also stores a first pair of public key and private key in key buffer 237, a second pair of public key and private key in key buffer 239, transaction log 241 for recording past franking transactions, counter 233 and other administrative information.

Because the contents of SRAM 207 need to be refreshed from time to time, SRAM 207 is required to be powered by a battery (not shown) in PSD 110. For fear that the battery power should be unexpectedly lost, the ascending register value and the transaction log are redundantly stored in flash memory 209 whose contents, unlike those of SRAM 207, need not be refreshed. Flash memory 209 also contains program instructions for processor 203 to orchestrate, in concert with cryptographic engine 220, the operation of PSD 110. This operation includes generation of digital signatures for inclusion in postage indicia to be franked or printed by printer 115 on envelopes, or labels for application onto mailpieces. The digital signatures are used to authenticate the respective postage indicia.

The generation of a digital signature and subsequent verification thereof require use of the key



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pair --private key 236a and public key 236b-- in buffer 237, in accordance with a well known public key algorithm. In a conventional manner, the pair of keys are generated mathematically. In this particular

5 illustrative embodiment, the public key algorithm used is the Digital Signature Algorithm (DSA) described, e.g., in "Digital Signature Standard (DSS)," FIPS PUB 186, May 19, 1994. Cryptographic engine 220 uses private key 236a to sign certain postal data. The resulting digital

10 signature, which is distinct for each postage indicium, is included in the indicium.

Unlike public key 236b which may be made available to the public in the postage indicium, the corresponding private key 236a needs to be securely

15 stored in PSD 110. Otherwise, using private key 236a which is illegally obtained by, say, tampering with PSD 110, a perpetrator may fraudulently generate postage indicia without accounting for the postage expended. Thus, to prevent fraud, for example, any tampering with

20 PSD 110 may cause the power of the battery therein to be cut off, thereby "zeroizing" or clearing some or all contents of SRAM 207, and each private key within PSD 110.

Similarly, the key pair --private key 238a and

25 public key 238b-- in buffer 239, different from the key pair in buffer 237, is used for authenticating communications with the aforementioned remote data center to set up and maintain PSD 110, and to account for the postage franked in accordance with the invention.

To keep track of the franking transactions

30 handled by PSD 110, processor 203 maintains counter 233 in SRAM 207, which counts in an ascending order starting from zero. Processor 203 causes counter 233 to increase its count by one each time to account for a new franking

35 transaction. Thus, the current count, denoted TID, is used to identify the franking transaction being conducted. Processor 203 also maintains transaction log

241 which records past franking transactions.

Fig. 3 illustrates the format of each transaction record in log 241. In this instance, each transaction is identified by a TID in field 301 of the record. Field 303 contains information concerning date and time of the transaction provided by clock 205. Field 305 contains information concerning the transaction amount, i.e., the postage franked in the transaction. Field 307 contains the ascending register value as a result of the transaction. Field 309 contains a FLAG which indicates whether any ascending register "rollover" has occurred in the current transaction. An occurrence of an ascending register rollover stems from the limited number of digits that ascending register 230 can accommodate. In this illustrative embodiment, register 230 can accommodate up to 9 digits. As a result, the maximum value which can be held by register 230 is 9,999,999.99. When a value is added to the current ascending register value with the resulting sum exceeding this maximum value, an ascending register rollover would occur and the left-most digit of the resulting sum would be truncated to maintain the 9 digit limit. Thus, for example, when ascending register 230 is at 9,999,998.98, if 1.04 is added thereto, the resulting ascending register value would be 0,000,000.02 because of the rollover, instead of the supposed sum 10,000,000.02 as the left most digit "1" of the supposed sum is truncated to maintain the 9 digit limit.

When PSD 110 is initially put in service, an initial record is created in log 241. In this initial record, field 301 contains TID = 0; field 303 indicates the date and time that PSD 110 is put in service; field 305 contains zero as the transaction amount since no postage has been franked; field 307 contains zero as the initial ascending register value; and field 309 contains Flag = 0 indicating no ascending register rollover has occurred.

When processor 203 conducts the first franking transaction to dispense first postage in response to a user request communicated through computer 105, processor 203 causes counter 233 to increase its count from zero to one, thereby identifying the first franking transaction with TID = 1. In addition, processor 203 adds the first postage value to the current ascending register value (which is zero in this instance). Processor 203 thereafter transmits to engine 220, an ensemble of information including (a) the first postage value, (b) the resulting ascending register value, and (c) a set of other postal data elements which need to be signed by engine 220 to generate a digital signature.

In response, engine 220 transmits the required digital signature to processor 203 for inclusion in a postage indicium to be printed by printer 115, thereby accomplishing the first franking transaction. Processor 203 then posts the transaction by creating a record in log 241, in accordance with the format of Fig. 3. The resulting record contains TID = 1 in field 301, the date and time that the first transaction occurs in field 303, the first postage value in field 305, the updated ascending register value in field 307, and FLAG = 0 in field 309 as no ascending register rollover has occurred in this transaction.

In addition, the updated value in ascending register 230 and the newly created record in log 241 are redundantly stored by processor 203 in flash memory 209.

Processor 203 conducts the subsequent franking transactions and creates the corresponding records in a manner similar to the above. However, the FLAG value in field 309 of the record of a particular transaction depends on whether any ascending register rollover described above has occurred in that particular transaction. Refer now to Figs. 4A and 4B which illustrate the records of two consecutive franking transactions by system 100, respectively. Fig. 4A

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illustrates transaction record 401 corresponding to transaction TID = 2233. As shown in field 307 of record 401, the ascending register value resulting from the transaction is 9,999,986.60. Since no ascending register rollover has occurred in this transaction, field 309 of record 401 has Flag = 0 indicating such.

Fig. 4B illustrates transaction record 402 corresponding to franking transaction TID = 2234. As shown in field 305 of record 402, the postage franked or the transaction amount is 15.25. As a result, had no ascending register rollover had occurred, field 307 of record 402 would have included a supposed sum  $9,999,986.60 + 15.25 = 10,000,001.85$ . However, this supposed sum exceeds the 9 digit limit that ascending register 230 can accommodate in this instance. As a result, an ascending register rollover occurs in this transaction and the left-most digit of the supposed sum is truncated. Thus, field 307 of record 402 contains 0,000,001.85 as the updated ascending register value. In addition, field 309 has FLAG = 1 indicating the ascending register rollover occurrence in this transaction.

Fig. 5 illustrates the postage finance arrangement in accordance with the invention where data center 503 communicates with franking systems 100 and 505-1 through 505-N to, among other things, obtain therefrom franking transaction records from time to time to account for their postage consumptions, respectively, where N represents an integer greater than or equal to one. In this illustrative embodiment, each of franking systems 505-1 through 505-N is structurally identical to system 100 described above. Data center 503 comprises computer system 507 which is capable of communicating data with selected ones of franking systems 100 and 505-1 through 505-N via communication connections established by modem pool 509. These connections may be, e.g., dial-up connections, Internet connections, etc. The data communications between data center 503 and the franking

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systems may be in accordance with the protocol disclosed in U.S. Patent No. 5,715,164 issued February 3, 1998 to Liechti et al.

In this illustrative embodiment, computer system 507 initiates communications with franking systems 100 and 505-1 through 505-N periodically to obtain the respective transaction records, from which the postage consumptions for the period is derived in a manner described below. Such postage consumptions are then accounted for by charging same to the accounts associated with the franking systems, where such accounts may be checking accounts, debit accounts, credit accounts, revolving credit accounts, prefunded accounts, escrow accounts, etc., held by one or more financial institutions. To that end, system 507 maintains database 540 therein, which contains financial account records concerning the respective franking systems served by data center 503. Alternatively, database 540 may be remote from data center 503.

Fig. 6 illustrates the format of each financial account record in database 540. In this instance, each franking system is identified by a PSD serial number in field 603 pre-assigned to its PSD. Field 605 contains information concerning the financial account associated with the franking system, which includes a financial account number, and data identifying the financial institution with which the account is maintained.

Since the number of franking systems served by data center 503 may be significant and their geographic locations, and thus the time zones they are in, may be very different, computer system 507 may not communicate with all of the franking systems at the same time. Rather, computer 507 communicates with the franking systems in a staggered manner. Preferably, the communication with each franking system takes place between the last mail pick-up of the day in the area where the franking system resides and the first mail

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pick-up of the following day in that area.

Thus, for example, let's say the last mail pick-up on each business day in the area where franking system 100 resides is at 5 p.m. (local time) and the first mail pick-up is at 8 a.m. the following business day. Computer system 507 may be programmed to communicate with system 100 between 5 p.m. each business day and 8 a.m. the following business day, e.g., 5:20 p.m. That is, at 5:20 p.m. each business day, computer system 507 initiates communications with system 100 to obtain those records in transaction log 241 having field 303 time-stamped after 5 p.m. of the previous business day up to 5 p.m. of the current business day. Even though system 100 may be used to frank additional postage after 5 p.m. of the day, such postage has not been "earned" by the postal authority as no postal service has been rendered thereby after 5 p.m. that day, and not until 8 a.m. the following day. In any event, such additional franked postage would be picked up by computer system 507 in the next reporting cycle. Thus, the present postage finance arrangement advantageously accounts for the expended postage for which postal service has been rendered.

It should be noted that if the mail pick-up times concerning a franking system vary, e.g., from day to day, the schedule of communications with the franking system can be programmed accordingly in computer system 507 to realize the present postage finance arrangement.

Continuing the above example, without loss of generality, computer system 507 is programmed to initiate a communication connection with franking system 100 at 5:20 p.m. on each business day. Through such a communication connection, computer system 507 requests from franking system 100 those transaction records in the current reporting cycle, i.e., those records time-stamped after 5 p.m. of the previous business day up to 5 p.m. of the current business day. In response, processor 203 in

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system 100 retrieves the transaction records in question from transaction log 241. The retrieved transaction records are then cryptographically signed and/or encrypted by cryptographic engine 220. In this instance, these records are cryptographically signed using private key 238a in buffer 239, in accordance with a well known data authentication algorithm, e.g., the DSA. The signed transaction records are transmitted to computer system 507 through the established communication connection.

After computer system 507 receives the signed transaction records from franking system 100, as indicated at step 703 in Fig. 7, system 507 in a well known manner uses public key 238b, a copy of which was provided thereto earlier, to authenticate the received records, as indicated at step 706. If the received records cannot be authenticated, system 507 at step 709 causes franking system 100 to re-transmit the signed records in question. However, a predetermined limit on the number of allowable re-transmissions is imposed. When such a limit is exceeded, computer system 507 may cause franking system 100 to shut down until it is satisfactorily audited and re-started by authorized personnel.

Otherwise, if the received transaction records are authenticated, computer system 507 at step 712 forwards a copy of the signed transaction records received from system 100 to postal authority computer 550 for storage and analysis purposes. Computer system 507 then computes the total postage incurred in the franking transactions based on the received records. It should be noted that the received records are in chronological order, with the first record time-stamped earliest in the current reporting cycle. At step 715, system 507 subtracts the ascending register value in field 307 of the first received record from that of the last received record, and adds to the difference the transaction amount in field 305 of the first received record. The resulting

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value is stored in a temporary buffer (not shown) in SRAM 207, as indicated at step 718. Such a value would equal the postage franked during the current reporting cycle, provided that no ascending register rollover occurred during such a cycle. Computer system 507 at step 721 determines any such rollover by identifying any FLAG = 1 in field 309 of the received records. If one or more of the records have FLAG = 1, for each rollover, computer system 507 at step 724 adds 10,000,000 to the value in the temporary buffer to obtain the correct postage franked during the cycle. In any event, computer system 507 at step 727 transmits the resulting temporary buffer value, representing the postage franked during the cycle to settlement system 565, along with the financial account information associated with system 100.

In response, settlement system 565 causes transfer of funds in the amount of the franked postage from the financial account associated with franking system 100 to a predetermined postal authority account. System 565 then sends to postal authority computer 550 a message indicating the completion of the funds transfer.

Postal authority computer 550 may analyze and/or audit the franking transaction records of franking system 100 for any reporting cycle, which were forwarded thereto by data center 503, to verify whether the amount of the funds transferred to the postal authority account matches the postage consumed by system 100 in that cycle. Specifically, computer 550 may retrieve from its storage the franking transaction records of system 100 of a selected reporting cycle. Computer 550 first uses public key 238b, a copy of which was provided thereto earlier, to authenticate the retrieved records. After the records are authenticated, computer 550 may retrace the franking transactions in the reporting cycle by going through the records one by one in chronological order. In particular, computer 550 examines field 305 and field 307 of each transaction record, which indicate the



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corresponding franking transaction amount, and the resulting ascending register value, respectively. Computer 550 then determines whether the ascending register value properly takes into account the transaction amount in the same record. If it does not, system 100 fails the audit. In that case, computer 550 generates an exception report concerning system 100 and transmits same to data center 503. Upon receiving the exception report, data center 503 causes system 100 to shut down until it is satisfactorily audited and re-started by authorized personnel.

The above-described postage finance arrangement in accordance with the invention may be readily modified to account for resource consumptions in general. For example, Fig. 8 illustrates an arrangement which, similar to the arrangement of Fig. 5, may be used to account for gas consumptions by customers of a natural gas company. Similar to data center 503, data center 803, which is operated and maintained by a resource consumption reporting company, from time to time communicates with gas meters 805-1 through 805-M in accordance with a predetermined protocol. In this instance, gas meters 805-1 through 805-M are structurally identical, and reside on customer premises to measure and report gas consumptions by the customers, respectively, where M represents an integer greater than one.

Fig. 9 illustrates one such gas meter, generically denoted 805. As shown in Fig. 9, meter 805 includes measuring device 903 which measures the amount of gas consumed by the customer associated therewith. Like PSD 110, meter 805 also includes memory 907 similar to SRAM 207, clock 905 similar to clock 205, and cryptographic engine 920 similar to cryptographic engine 220. Memory 907 comprises counter 833 similar to counter 233, and register 930 similar to ascending register 230 to keep track of the amount of gas consumed. Processor 903 creates consumption records periodically, e.g., once

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every 15 minutes, to account for the gas consumptions in the corresponding periods. The format of each consumption record is similar to that of Fig. 3, although the field corresponding to field 305 contains information concerning the amount of gas consumed in the corresponding period instead of a transaction amount. The consumption records, thus created, constitute consumption log 941 in memory 907. The records may be cryptographically signed before they are communicated to data center 803 through communication facility 945 which includes, e.g., a modem. To that end, memory 907 includes at least private key 938 for use by cryptographic engine 920 to cryptographically sign the consumption records, in accordance with a public key algorithm, e.g., the DSA. Copies of the public key corresponding to private key 938 are provided beforehand to data center 803 and gas company computer 850 for authenticating the consumption records communicated by meter 805.

Like data center 503, data center 803 polls each of gas meters 805-1 through 805-M for consumption records of each reporting cycle. Data center 803 then receives and processes the records in accordance with a routine similar to that of Fig 7. Data center 803 computes the charges for the gas consumption during the reporting period, and transmits the computed charges and the financial account information associated with the gas meter to settlement system 865. Like settlement system 565, settlement system 865 causes transfer of funds covering such charges from the financial account associated with the gas meter to a predetermined gas company account. System 865 then sends to gas company computer 850 a message indicating the completion of the funds transfer.

Like postal authority computer 550, gas company computer 850 may audit the gas consumption records of a gas meter for any reporting cycle, which were forwarded

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thereto by data center 803. In addition, computer 850 may analyze the received consumption records to obtain statistics concerning relative gas demands in different geographic areas served by the natural gas company.

- 5 Based on such statistics, computer 850 may effectively manage the supply of gas from its limited sources to the different geographic areas according to their demands. To that end, computer 850 may control the gas transport to direct calculated amounts of gas to the respective
- 10 areas. Thus, with the inventive arrangement, the shorter is the reporting cycle, the closer the gas distribution to customers to a just-in-time fashion.

- It should be noted that data center 803 may serve more than one provider providing resources to
- 15 effect the finance arrangement in accordance with the invention. Fig. 10 illustrates one such arrangement where data center 803 serves a gas company and an electric company to account for the gas consumptions and electric consumptions by their customers, respectively.
- 20 As shown in Fig. 10, apart from gas meters 805-1 through 805-M, electric meters 1005-1 through 1005-K, which are designed similarly to meter 805, communicate records of electric consumptions to data center 803 in accordance with the predetermined protocol, where K represents an
- 25 integer greater than one. Data center 803 computes the charges for the respective gas and electric consumptions, and causes settlement system 865 to transfer funds covering such charges from the customer accounts to the predetermined gas company and electric company accounts,
- 30 respectively. In addition, gas company computer 950 and electric company computer 1050 may audit and/or analyze the consumption records forwarded thereto by data center 803.

- Based on the disclosure heretofore, it is
- 35 apparent that the arrangement of Fig. 10 can be expanded to serve many different resource providers as long as the devices measuring the resource consumptions are capable

of communicating consumption records to data center 803 in accordance with the predetermined protocol. Of course, one such resource provider may be a postal authority providing a postal service described before.

- 5 Thus, it is apparent that data center 803 may communicate with franking systems similar to system 100 described before, as well as utility meters similar to meter 805, in accordance with the same predetermined protocol to effect the inventive finance arrangement.

- 10 The foregoing merely illustrates the principles of the invention. It will thus be appreciated that those skilled in the art will be able to devise numerous other arrangements which embody the principles of the invention and are thus within its spirit and scope.

- 15 For example, in the disclosed embodiment, certain communication data is cryptographically signed for authentication purposes. It will be appreciated that such data may be cryptographically encrypted and/or signed.

- 20 In addition, in the disclosed embodiment, the DSA is illustratively used to perform data authentication, another well-known data authentication algorithm such as the RSA or Elliptic Curve algorithm may be used, instead.

- 25 Further, in the disclosed embodiment, franking system 100 is configured as an open system. It will be appreciated that the franking system may be configured as a closed system in the form of a postage meter including therein a dedicated printer.

- 30 Finally, PSD 110 and meter 805 are disclosed herein in a form in which various functions are performed by discrete functional blocks. However, any one or more of these functions could equally well be embodied in an arrangement in which the functions of any one or more of  
35 those blocks or indeed, all of the functions thereof, are realized, for example, by one or more appropriately programmed processors.

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Claims

1. Apparatus for accounting for consumption of a resource comprising:

5 a memory for providing a value indicative of a cumulative measure of the consumption;

a processor for generating a plurality of records, each record including at least time information, an individual measure of the consumption, and the value taking into account the individual measure; and

10 an output device for transmitting ones of the records selected based on the time information therein.

2. The apparatus of claim 1 wherein each record also includes an indicator indicative of a truncation of the value.

15 3. The apparatus of claim 1 wherein the consumption of the resource includes utilization of a postal service, and the individual measure includes postage dispensed for the utilization of the postal service.

20 4. The apparatus of claim 3 wherein each record is associated with a different transaction of postage dispensation.

25 5. The apparatus of claim 4 wherein the time information in each record is indicated by an index identifying the transaction associated with the record.

6. The apparatus of claim 4 wherein the time information in each record concerns a time of the  
30 transaction associated with the record.

7. The apparatus of claim 3 further comprising a controller for generating at least part of a postage

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indicium.

8. The apparatus of claim 1 wherein the consumption includes a utility consumption.

5 9. The apparatus of claim 1 further comprising a controller for cryptographically processing the plurality of records.

10 10. The apparatus of claim 9 wherein the plurality of records are cryptographically signed to authenticate the records.

11. A system for processing charges for consumptions of at least one resource, the consumptions being measured using a plurality of devices, each device being associated with a different financial account, the system comprising:  
15 a receiver for receiving a plurality of records from each device, each record including at least a measure of a consumption of the resource;  
a processor for determining, for each device, charges for the consumption of the resource based on a  
20 subset of the records received from the device; and  
a transmitter for transmitting, for each device, the charges and information concerning the financial account associated with the device to a second system for settlement of the charges, and for  
25 transmitting the plurality of records associated with the device to a third system for storage.

12. The system of claim 11 wherein the measure of the consumption of the resource in each record includes an amount of individual postage dispensed for utilization  
30 of a postal service.

13. The system of claim 12 wherein each record also

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includes a value indicative of cumulative postage dispensed, the value taking into account the amount of the individual postage in the record.

14. The system of claim 13 wherein each record also  
5 includes an indicator indicative of a truncation of the value.

15. The system of claim 12 wherein each record is associated with a different transaction of postage  
10 dispensation.

16. The system of claim 11 wherein the plurality of records include more than two records, and the subset of the records includes two selected records.

- 15 17. The system of claim 11 wherein the resource includes a utility resource.

18. The system of claim 11 further comprising a controller for cryptographically processing the plurality of records.

- 20 19. The system of claim 18 wherein the plurality of records are cryptographically signed to authenticate the records.

20. A system for assessing charges for consumptions of at least first and second different resources, the  
25 system comprising:

a communication apparatus for communicating with at least first and second devices, the first device providing a first measure of consumption of the first resource, the second device providing a measure of  
30 consumption of the second, different resource;

a processor for determining first charges based on the first measure of consumption of the first resource,

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and second charges based on the second measure of consumption of the second, different resource; and

- 5 a transmitter for providing first information concerning the first charges and a first account associated with the first device, and second information concerning the second charges and a second account associated with the second device for settlement of the first and second charges.

- 10 21. The system of claim 20 wherein the first and second resources include different utility resources.

22. The system of claim 20 wherein the first resource includes a postal service.

23. The system of claim 22 wherein the second resource includes a utility resource.

- 15 24. The system of claim 23 wherein the utility resource is a natural gas resource.

25. The system of claim 23 wherein the utility resource is an electric resource.

- 20 26. The system of claim 22 wherein the first device provides at least an amount of postage dispensed for the postal service.

- 25 27. The system of claim 22 wherein the first device includes a processor for generating at least part of a postage indicium.

28. The system of claim 22 wherein the first device includes a controller for generating at least part of a postage indicium.



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29. A method for use in an apparatus for accounting for consumption of a resource comprising:

providing a value indicative of a cumulative measure of the consumption;

- 5       generating a plurality of records, each record including at least time information, an individual measure of the consumption, and the value taking into account the individual measure; and  
transmitting ones of the records selected based  
10 on the time information therein.

30. The method of claim 29 wherein each record also includes an indicator indicative of a truncation of the value.

31. The method of claim 29 wherein the consumption  
15 of the resource includes utilization of a postal service, and the individual measure includes postage dispensed for the utilization of the postal service.

32. The method of claim 31 wherein each record is  
20 associated with a different transaction of postage dispensation.

33. The method of claim 32 wherein the time  
information in each record is indicated by an index  
25 identifying the transaction associated with the record.

34. The method of claim 32 wherein the time information in each record concerns a time of the transaction associated with the record.

35. The method of claim 31 further comprising  
30 generating at least part of a postage indicium.

36. The method of claim 29 wherein the consumption includes a utility consumption.

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37. The method of claim 29 further comprising cryptographically processing the plurality of records.

38. The method of claim 37 wherein the plurality of records are cryptographically signed to authenticate the records.

39. A method for use in an arrangement for processing charges for consumptions of at least one resource, the consumptions being measured using a plurality of devices, each device being associated with a different financial account, the arrangement including a first system and a second system, the method comprising:

receiving a plurality of records from each device, each record including at least a measure of a consumption of the resource;

determining, for each device, charges for the consumption of the resource based on a subset of the records received from the device; and

transmitting, for each device, the charges and information concerning the financial account associated with the device to the first system for settlement of the charges, and for transmitting the plurality of records associated with the device to the second system for storage.

40. The method of claim 39 further comprising re-allocating the resource based on statistics derived from the records stored in the second system.

41. The method of claim 39 wherein the measure of the consumption of the resource in each record includes an amount of individual postage dispensed for utilization of a postal service.

42. The method of claim 41 wherein each record also includes a value indicative of cumulative postage

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dispensed, the value taking into account the amount of the individual postage in the record.

43. The method of claim 42 wherein each record also includes an indicator indicative of a truncation of the value.

44. The method of claim 41 wherein each record is associated with a different transaction of postage dispensation.

45. The method of claim 39 wherein the plurality of records include more than two records, and the subset of the records includes two selected records.

46. The method of claim 39 wherein the resource includes a utility resource.

47. The method of claim 39 further comprising cryptographically processing the plurality of records.

48. The method of claim 47 wherein the plurality of records are cryptographically signed to authenticate the records.

49. A method for use in a system for assessing charges for consumptions of at least first and second different resources, the system including at least first and second devices, the first device providing a first measure of consumption of the first resource, the second device providing a measure of consumption of the second, different resource, the method comprising:

receiving from the first device the first measure of consumption of the first resource, and from the second device the second measure of consumption of the second, different resource;

determining first charges based on the first

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measure of consumption of the first resource and second charges based on the second measure of consumption of the second, different resource; and

- 5 providing first information concerning the first charges and a first account associated with the first device, and second information concerning the second charges and a second account associated with the second device for settlement of the first and second charges.

- 10 50. The method of claim 49 wherein the first and second resources include different utility resources.

51. The method of claim 49 wherein the first resource includes a postal service.

52. The method of claim 51 wherein the second resource includes a utility resource.

- 15 53. The method of claim 52 wherein the utility resource is a natural gas resource.

54. The method of claim 52 wherein the utility resource is an electric resource.

- 20 55. The method of claim 51 wherein the first charges include an amount of postage dispensed for the postal service.

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Fig. 1

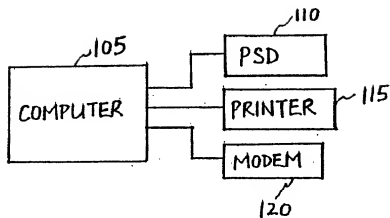
100

Fig. 2

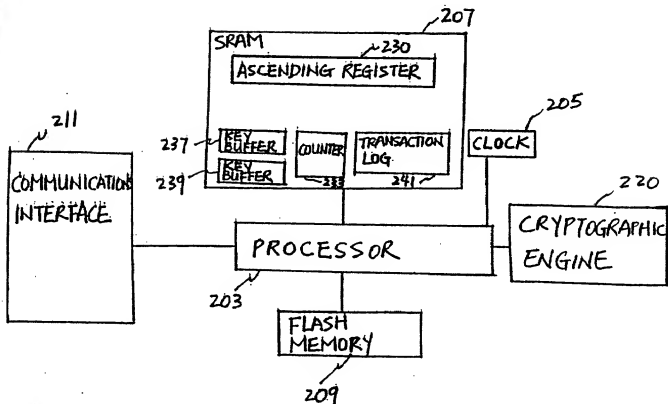
110

Fig. 3<sup>2/5</sup>

301	303	305	307	309
TID	DATE AND TIME OF TRANSACTION	TRANSACTION AMOUNT	ASCENDING REGISTER VALUE	FLAG

Fig. 4A

2233	11-20-1999 9:40 AM	0.33	9,999,986.60	0
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Fig. 4B

2234	11-20-1999 9:45 AM	15.25	0,000,001.8	1
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Fig. 5

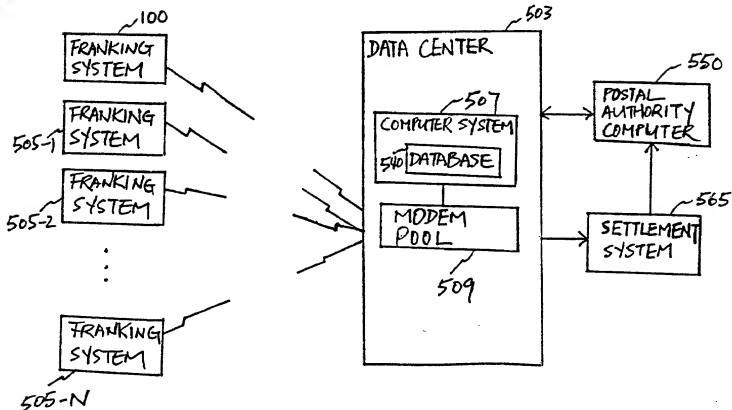


Fig. 7

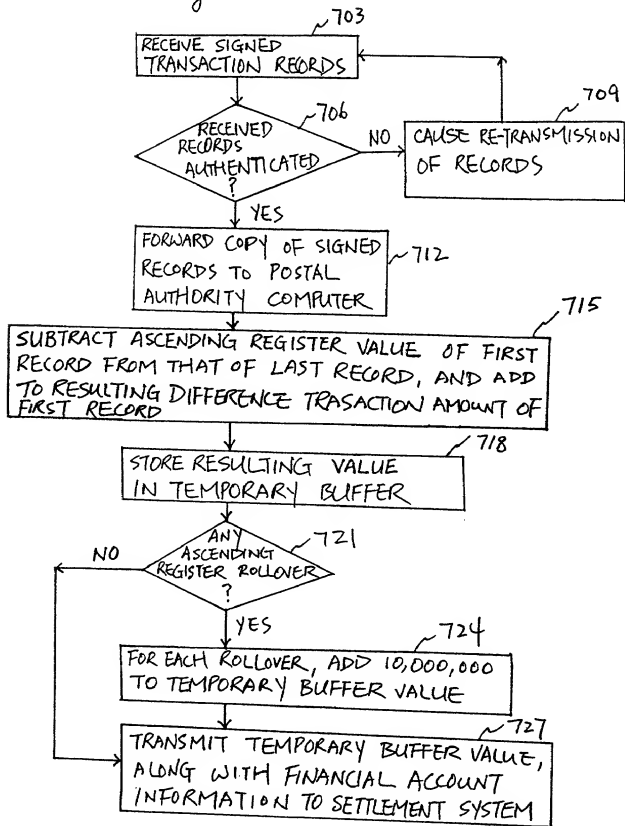


Fig. 4/5

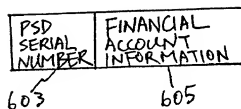


Fig. 8

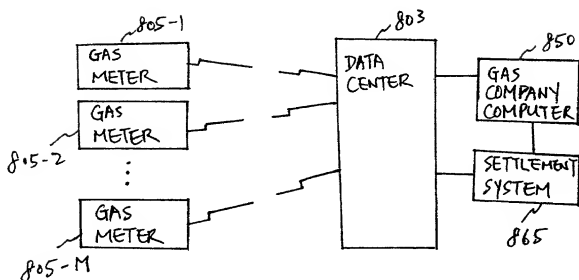


Fig. 9

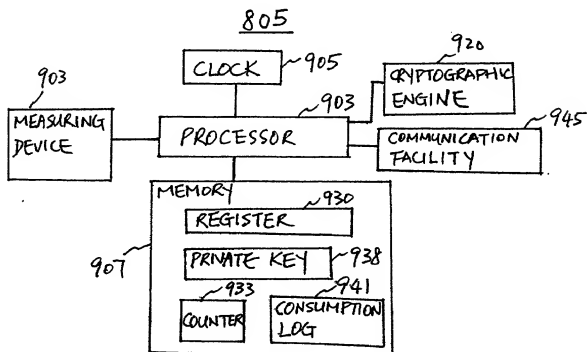
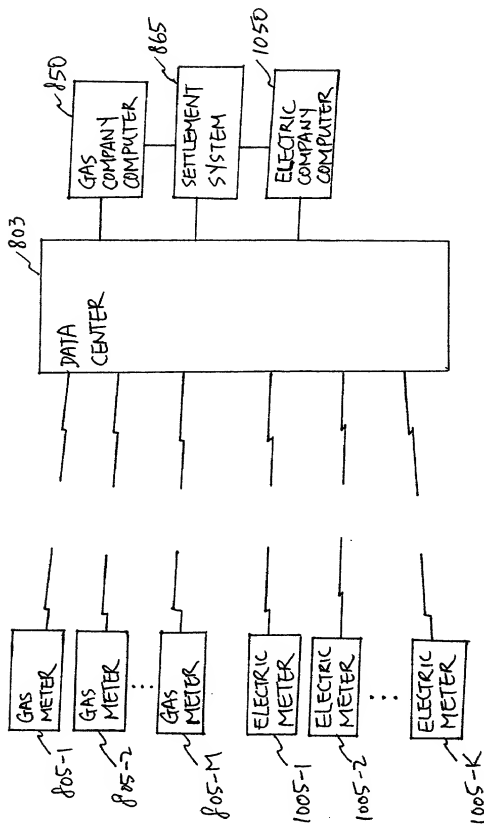




Fig. 10



# DECLARATION AND POWER OF ATTORNEY FOR PATENT APPLICATION

## English Language Declaration

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name,

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

Title: **TECHNIQUE FOR EFFECTIVE MANAGEMENT OF RESOURCE CONSUMPTION**

the specification of which

(check one)

☐

is attached hereto.

**X** was filed on \_\_\_\_\_ as United States Application No. 09/914,753 or PCT  
International Application Number PCT/US00/03585 filed February 11, 2000  
and was amended on (if applicable)

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose to the United States Patent and Trademark Office all information known to me to be material to patentability as defined in Title 37, Code of Federal Regulations, Section 1.56.

I hereby claim foreign priority benefits under Title 35, United States Code, Section 119(a)-(d) or Section 365(b) of any foreign application(s) for patent or inventor's certificate, or Section 365(a) of any PCT International Application which designated at least one country other than the United States, listed below and have also identified below, by checking the box, any foreign application for patent or inventor's certificate or PCT International application having a filing date before that of the application on which priority is claimed.

### Prior Foreign Application(s)

(Number)	(Country)	(Day/Month/Year Filed)	Priority Not Claimed
PCT/US00/03585	PCT	11 February 2000	<input type="checkbox"/>
			<input type="checkbox"/>
			<input type="checkbox"/>
			<input type="checkbox"/>

I hereby claim the benefit under 35 U.S.C. Section 119(e) of any United States provisional application(s) listed below:

60/122,826

(Application Serial No.)

4 March 1999

(Filing Date)

\_\_\_\_\_  
(Application Serial No.)

\_\_\_\_\_  
(Filing Date)

\_\_\_\_\_  
(Application Serial No.:

\_\_\_\_\_  
(Filing Date)

I hereby claim the benefit under 35 U.S.C. Section 120 of any United States application(s), or Section 365(c) of any PCT International Application designating the United States, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT International Application in the manner provided by the first paragraph of 35 U.S.C. Section 112, I acknowledge the duty to disclose to the United States Patent and Trademark Office all information known to me to be material to patentability as defined in Title 37, C.F.R., Section 1.56 which became available between the filing date of the prior application and the national or PCT International filing date of this application:

\_\_\_\_\_  
(Application Serial No.)

\_\_\_\_\_  
(Filing Date)

\_\_\_\_\_  
(Status)  
(patented, pending, abandoned)

\_\_\_\_\_  
(Application Serial No.)

\_\_\_\_\_  
(Filing Date)

\_\_\_\_\_  
(Status)  
(patented, pending, abandoned)

\_\_\_\_\_  
(Application Serial No.)

\_\_\_\_\_  
(Filing Date)

\_\_\_\_\_  
(Status)  
(patented, pending, abandoned)

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

POWER OF ATTORNEY: As a named inventor, I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith. (list name and registration number)

All attorneys listed under Customer No.: 2512

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Fourth inventor's signature:

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Full name of fifth inventor:

Fifth inventor's signature:

DATE

Residence address:

Citizenship:

Post Office Address:

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